Surface Ozone Protocol
Student Field Guide

Task:

- Measure the level of surface ozone
- Record the cloud conditions and current atmosphere temperature

What you need:

- One Ozone Measuring Strip
- Plastic bag to carry the measuring strip to your site
- Hand held scanner
- Clipboard
- Surface Ozone Data Worksheet
- Pen or pencil
- GLOBE Cloud Chart
- Wind Direction Instrument
- Key to your instrument shelter
- A clock or watch to record the start and stop time of your observations and the exposure of the strip

NOTE: Wind direction and current temperature may be taken from an automated weather station.

In the field:

1. Calibrate the scanner in the environment you are going to read the chemical strip.
2. Remove a single ozone measuring strip from the plastic bag, and place it in the clip on the monitoring station. Do not touch the chemical part of the strip at any time. It is not harmful to you, but it may prevent you from getting an accurate measurement. Record the date, starting time, cloud cover and type, current temperature, and wind direction when you place the ozone strip in the monitoring station.
3. One hour later, return to the ozone monitoring station and remove the ozone strip from the clip.
4. Slide the chemical strip into the slot on top of the hand-held scanner. Locate a shaded area, and place the scanner on a solid surface to read the measurement identified by the scanner. Record the parts per billion (ppb) identified by the scanner onto the chart.
5. Record the time you read the ozone strip.
6. Determine the cloud type and cover following the *Cloud Cover and Cloud Type Protocols*. Record your observations on the Surface Ozone Data Worksheet.
7. Open the instrument shelter and read the current temperature from the level of the mercury in the maximum/minimum thermometer. Do not touch or breathe on the thermometer. Record your temperature reading and close the instrument shelter.

8. Use the wind direction instrument and record the direction the wind is blowing.

Frequently Asked Questions

Q. What if the ozone strip doesn't have any color change after one hour?

A. If there is no color change, enter 0 on the data sheet, because it indicates that there is very little or no surface ozone present.

Q. What if the ozone strip got wet due to rain or snow and the color is marbled, or the surface is not one complete color?

A. Your ozone measurement strip is contaminated or spoiled which means the data are not accurate. Report your data as "M" to the NASA Ozone Data Server. Include a comment note on weather conditions, which may have affected your results. Still measure the current temperature, cloud cover and cloud type and report them.

Q. We are not in school on the weekend, how can we collect data?

A. Persistence in data collection is important, so work with your team to arrange for a volunteer to bring one or two students to your Atmosphere Study Site on weekends and holidays if possible. Data from school days alone are still valuable, but for some school sites the ozone concentration during the weekend days will be systematically different. Do you Know why?

Q. Can the plastic disk and strip be placed on the weather station?

A. No. They would interfere with the rain gauge and should be on a different post.

Q. Why is it important to take the temperature reading after recording the ozone level?

A. The strip will continue to respond to the gases in the air. So it is important to take the ozone reading and then the temperature reading.